

ABSTRACT OF THE DISCLOSURE

Fluorine gas discharge laser electrodes and electrode systems are disclosed that may comprise a plurality of current return tangs extending for less than the respective length of the second elongated gas discharge electrode. In addition disclosed are electrodes that may comprise a first discharge shaping magnet 10 mounted in a first elongated gas discharge electrode and a second discharge shaping magnet mounted in a second elongated gas discharge electrode. This may also comprise at least one of the first and second gas discharge electrodes has imbedded therein a first and a second auxiliary field creating magnet. Also disclosed is an electrode that may comprise a crown straddling the centerline axis between the pair 15 of side walls and the pair of end walls, comprising a first material, forming at least a portion of the discharge region of the electrode and a pair of elongated high erosion regions on either side of the crown comprising a second material with a relatively higher erosion rate during gas discharge than that of the first material. Also disclosed are electrodes that may comprise a first insert in the electrode body 20 comprising an electrically conductive material having a different coefficient of thermal conductivity than the electrode body. Also disclosed are electrodes that may have a thin film of semi-conductive material coating at least the discharge footprint of the gas discharge electrode, or at least a portion of the discharge region covered with a pre-formed reef having generally uniform pore size and distribution, and 25 methods of making such coatings or reef. Also disclosed is a method of forming an electrode by diffusion bonding a first piece of a first material to a second piece of a second material utilizing a diffusion bonding catalyst between the first piece of material and the second piece of material during the diffusion bonding step and machining the bonded pieces to form an electrode.